

REMARKS/DISCUSSION OF ISSUES

By this Amendment, Applicants amend claims 1 and 9 to incorporate the subject matter of claims 3 and 11, respectively, without disclaimer of the original subject matter or prejudice against future prosecution, for example, in a continuation application. Accordingly, claims 3 and 11 are canceled at this time.

Therefore, claims 1-2, 4-19, and 12-18 are pending in the application.

Since the amended claims 1 and 9 correspond identically to the originally-filed claims 3 and 11, Applicants respectfully submit that this amendment cannot possibly raise any new issues that necessitate any further search or consideration, and so entry of the amendment at this time is respectfully requested.

Applicants acknowledge the allowance of claims 6-8 and 14-16, and the indication that claims 4, 5, 12 and 13 define patentable subject matter and would be allowable if rewritten in independent form, including all limitations of the base claim and any intervening claims.

Reexamination and reconsideration are respectfully requested in view of the following Remarks.

35 U.S.C. §§ 102 & 103

The Office Action rejects claims 1-2 and 9-10 under 35 U.S.C. § 102 over Schramm U.S. Patent Publication 2002/0110138A1 ("Schramm"), and claims 17-18 under 35 U.S.C. § 103 over Schramm in view of Beek et al., "*On Channel Estimation in OFDM Systems*," 25 July 1995, pp. 815-819 ("Beek").

Applicants respectfully traverse those rejections for at least the following reasons.

Claim 1

Among other things, the method of claim 1 includes using training symbols to derive a simplified channel estimate that assumes no interference is present in the unknown multi-path channel.

Applicants respectfully submit that Schramm does not disclose such a

combination of features. Applicants respectfully submit that nothing in the Abstract, FIGS. 4a-b, or paragraphs [0076]-[0086] or [[0096]-[0103] discloses deriving any simplified channel estimate. Indeed, the undersigned attorney has carefully reviewed Schramm, and does not see any such feature mentioned or suggested anywhere in Schramm.

Furthermore, in particular claim 1 recites that the simplified channel estimate is one that assumes no interference is present in the unknown multi-path channel. This feature was recited in the originally filed claim 3.

The Office Action states that Schramm discloses such a simplified channel estimate that assumes no interference is present in the unknown multi-path channel at paragraphs [0072], [0075]-[0086] and [0096]-[0103].

Applicants respectfully disagree. Indeed, in stark contrast, the cited text very specifically teaches that the channel model does assume interference is present in the channel. For example, the cited paragraph [0072] describes Schramm's communication channel model. That model defines the parameter $Z_m[k]$ as "noise or interference sample on subcarrier in OFDM symbol k ." The cited paragraph [0075] states that "noise and/or interference with an unknown level is added via an addition ADD on each subcarrier." Also, paragraph [0099] states that both the signal power variation and the SNR variation determined by Schramm characterize the impact of the channel impulse response as well as the instantaneous interference power spectrum on the error rate.

So it is seen that the text cited in the Office Action very much does not disclose a simplified channel estimate that assumes no interference is present in the unknown multi-path channel.

Accordingly, for at least these reasons, Applicants respectfully submit that claim 1 is patentable over Schramm.

Meanwhile, in the event that the Examiner maintains a rejection of claim 1 over Schramm, in order to clarify the record for a possible subsequent appeal to the Board of Patent Appeals, Applicants respectfully request that the Examiner provide

with particularity a citation to anything in Schramm that supposedly specifically discloses using training symbols to derive a simplified channel estimate that assumes no interference is present in the unknown multi-path channel, and then estimating a noise variance of the narrowband interference using that very same simplified channel estimate.

Otherwise, it is respectfully requested that the rejection of claim 1 be withdrawn and the claim be allowed.

Claim 2

Claim 2 depends from claim 1 and is deemed patentable for at least the reasons set forth above with respect to claim 1.

Claim 9

Among other things, the system of claim 9 includes means for using training symbols to derive a simplified channel estimate that assumes no interference is present in the unknown multi-path channel.

For similar reasons to those set forth above with respect to claim 1, Applicants respectfully submit that Schramm does not disclose such a feature.

Accordingly, for at least these reasons, Applicants respectfully submit that claim 9 is patentable over Schramm.

Claim 10

Claim 10 depends from claim 9 and is deemed patentable for at least the reasons set forth above with respect to claim 9.

Claims 17-18

Claim 17 depends from claim 1, and claim 18 depends from claim 9. Applicants respectfully submit that Beek does not remedy the shortcomings of Schramm as set forth above with respect to claims 1 and 9. Accordingly, Applicants respectfully submit that claims 17-18 are deemed patentable for at least the reasons set forth above with respect to claims 1 and 9, respectively, and for the following additional reasons.

In claims 17 and 18, a channel impulse response frequency matrix is

calculated for each frequency bin in the frequency domain OFDM data packet assuming that all noise in the channel is white Gaussian noise with zero mean and variance.

The Office Action fairly admits that Schramm does not disclose such a combination of features.

However the Office Action states that Beek discloses such a feature and that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Schramm to derive a channel estimate by calculating a channel impulse response frequency matrix for each frequency bin in the frequency domain OFDM data packet assuming that all noise in the channel is white Gaussian noise with zero mean and variance.

Applicants respectfully disagrees that Beek discloses these features, and also traverse the proposed combination of Schramm and Beek as having no reason therefor that would be known to one of ordinary skill in the art at the time the invention was made.

At the outset, the cited text in Beek does not make any mention of zero variance, as featured in claims 17 and 18. So no combination of Schramm and Beek could ever produce method and system of claims 17 and 18, respectively.

Furthermore, the Office Action fails to explain how or why such a modification would *"improve the noise averaging capability by removing the effect of synchronization errors during the channel estimation process"* – or even where it is taught that such synchronization errors even exist in Schramm's channel estimation process!

It is well established that a claim may not be rejected upon unknown authority or speculation. M.P.E.P. § 2144.03(A) and (C). No evidence at all has been offered in support of this proposed reason for the combination, nor has the Examiner provided an affidavit if this reasoning is based on the Examiner's own personal knowledge. Applicants respectfully request such an affidavit pursuant to 37 CFR 1.104(d)(2) if claims 17 and 18 are rejected based on a combination whose reason is

founded only in the Examiner's own personal knowledge (see M.P.E.P. § 2144.03(C)).

Accordingly, for at least these reasons, Applicants respectfully submit that claims 17 and 18 are patentable over Schramm.

Meanwhile, in the event that the Examiner maintains a rejection of claims 17 and 18 over Schramm and Beek, then in order to clarify the record for a possible subsequent appeal to the Board of Patent Appeals, Applicants respectfully request that the Examiner provide with particularity a citation to anything in that supposedly specifically discloses any of these things.

Otherwise, it is respectfully requested that the rejections of claims 17 and 18 be withdrawn and the claims be allowed.

CONCLUSION

In view of the foregoing explanations, Applicants respectfully request that the Examiner reconsider and reexamine the present application, allow claims 1-2, 4-19, and 12-18 and pass the application to issue. In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Kenneth D. Springer (Reg. No. 39,843) at (571) 283.0720 to discuss these matters.

Respectfully submitted,

VOLENTINE & WHITT

By: 

Kenneth D. Springer
Registration No. 39,843

VOLENTINE & WHITT
One Freedom Square
11951 Freedom Drive, Suite 1260
Reston, Virginia 20190
Telephone No.: (571) 283.0724
Facsimile No.: (571) 283.0740